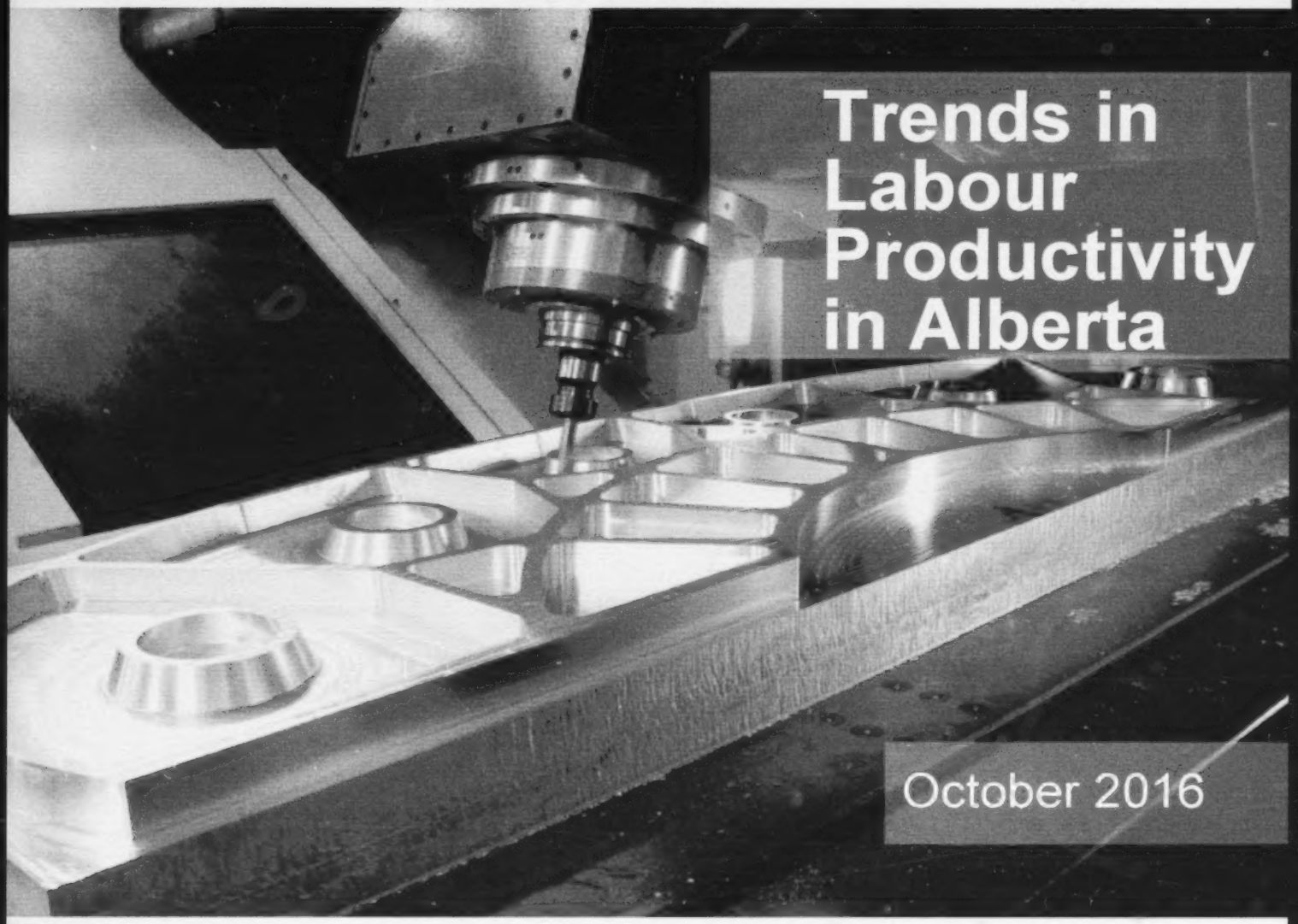

Trends in Labour Productivity in Alberta

October 2016

Alberta

Canada

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Introduction

Labour productivity is one of the important determinants in maintaining and enhancing sustained prosperity for Albertans. Higher productivity growth will alleviate some of Alberta's future labour supply issues arising from an aging work force and decreasing labour force growth, and will also increase Alberta's international competitiveness and thereby secure long-term economic growth. The key drivers of labour productivity include skills and human capital, capital investment, and innovation.

Labour productivity is measured by Gross Domestic Product (GDP) per hour worked. In this report, Alberta's performance in labour productivity will be analyzed relative to other provinces and by industry. Labour productivity is affected by both the quality of human capital (education, training, skills and experience) and by the amount and sophistication of the equipment, tools and machinery being used. Investment in people and equipment is therefore foundational to productivity growth. However, the innovative manner in which people apply their knowledge and skills is also crucial to productivity growth. Promoting a culture of innovation is a key element of the productivity equation.

In June 2016, Statistics Canada released provincial productivity estimates for the years 1997 to 2015. This report provides an update of the Trends in Labour Productivity report that was released on June 2016 just days before the most recent update.

Alberta has the Highest Labour Productivity Level in Canada

According to Statistics Canada, Alberta has the highest labour productivity in the country. In 2015, labour productivity in Alberta's business sector was $69.30 per hour (Chart 1), 39% higher than the Canadian average of $49.90 per hour. Newfoundland and Labrador had the second highest productivity level at $64.30 per hour, followed by Saskatchewan at $56.50. The high productivity levels in these three provinces are mainly the result of their large and highly productive oil and gas extraction sectors.

Chart 1

Business Sector Productivity of Labour - 2015

(Real GDP per Hour Worked, in 2007 constant dollars)

Source: Statistics Canada -- Table 383-0029, Labour productivity and related variables by business sector

Ten-Year Productivity Trends

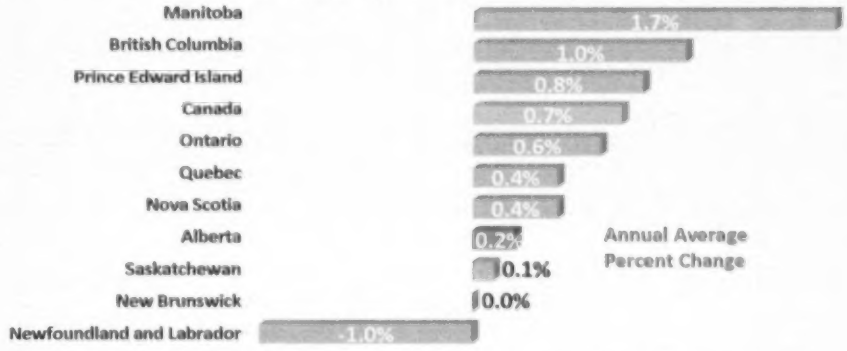
Between 2005 and 2015, GDP in Alberta's business sector increased by 23.9% or 2.2% per year, the weakest 10-year GDP growth rate in more than 20 years. Over the same period, the total number of hours worked increased by 21.1% or 1.9% per year. As a result, labour productivity rose only 2.4% over the 10-year time period or 0.2% per year, the weakest productivity growth since the 10-year period ending in 2010. In other words, most of the increase in GDP came as a result of increased labour input and only about one-tenth was the result of increased labour productivity.

Why have labour productivity growth and GDP growth weakened so much in recent years? Ten-year economic growth was weak because the 2005 to 2015 period includes two Alberta recessions: in 2009 GDP in Alberta's business sector fell 7.2%; and in 2015 it declined by 5.2%. Labour productivity also declined during these two recessions but at much lower rates: it fell 1.2% in 2009 (and 1.4% in 2008) and 3.6% in 2015.

Alberta's 0.2% average annual growth rate in labour productivity was one of the lowest provincial growth rates over the 10-year period (Chart 2) and was much lower than the Canadian increase of 0.7% per year. Manitoba had the highest productivity growth rate at 1.7% per year, followed by British Columbia at 1.0%. In 2015, Alberta's productivity fell by 3.6% from 2014, the largest provincial decline for that year, Canadian labour productivity fell 0.4% in 2015, mainly because of Alberta's steep drop, while P.E.I. led all provinces with a 5.3% increase.

Chart 2

Business Sector Labour Productivity Growth Rates
2005 - 2015 (Based on Hours Worked)



Source: Statistics Canada -- Table 383-0029, Labour productivity and related variables by business sector industry

The average annual productivity increase of 0.2% for the years 2005 to 2015 is much less than the average rate of 0.8% recorded for the 10-year period ending in 2014. The deterioration in the productivity growth rate is the result of the current recession that started in Alberta in 2015 and caused sharp productivity declines in a number of sectors, especially the construction and oil and gas services sectors. Ten-year growth is also weak because of long-term productivity declines in the oil and gas extraction sector: prior to 2014 productivity in that sector steadily declined as Alberta's conventional oil and gas reserves were slowly depleting and new oil sands projects had staff on-site years before they started to produce bitumen or synthetic crude oil. Starting in 2014, oil and gas extraction sector productivity increased as oil sands projects went into production and as conventional crude oil

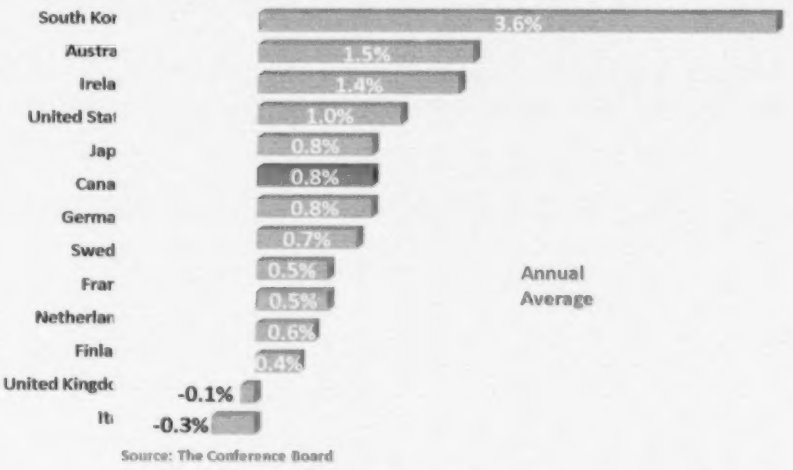
production staged a recovery. As a result, productivity in the oil and gas extraction sector grew robustly in 2014 and in 2015.

Alberta's long-term productivity growth rate is now much lower than the United States' 1.0% growth rate over the same period and also lower than that of most other international competitors (Chart 3[1]).

Most of Alberta's productivity gains occurred from 2010 to 2014 (see also Chart 4). Productivity growth was elusive prior to 2010 as a result of the aforementioned sharp productivity decline in the oil and gas extraction sector and also because of the global recession of 2009. It again declined in 2015 because of the current recession.

Chart 3

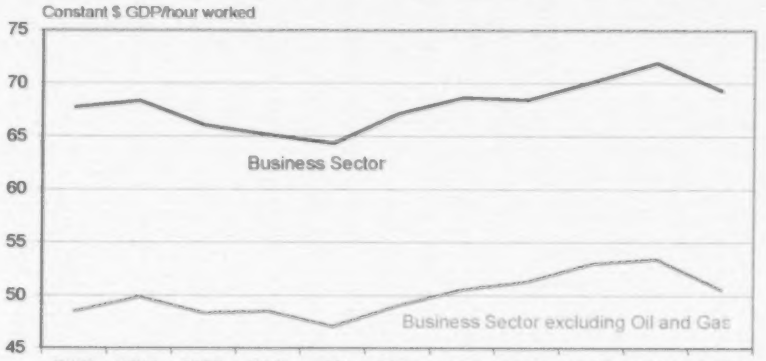
International Labour Productivity Growth Rates
2005 - 2015 (Based on Hours Worked)



Source: The Conference Board

Chart 4

Productivity Levels in Alberta
Business Sector and Business Sector excluding Oil



Sources: Statistics Canada and Alberta Economic Development & Trade

[1] Productivity growth rates in the international comparison (Chart 3) are based on the total economy rather than the business sector and therefore Canada's growth rate in Chart 3 is not directly comparable to the one in Chart 2

The Oil and Gas Sector is Boosting Alberta's Overall Productivity Level

Alberta's high productivity level is in large part the result of its large and capital-intensive oil and gas extraction sector. In 2015, the labour productivity level in the mining and oil and gas sector was $269 per hour (Chart 5), because of very high levels in the oil and gas extraction sub-sector ($447 per hour). Levels in this capital-intensive industry are high as output (or GDP) per worker and per hour worked is high because this industry uses relatively more capital than labour in its production processes.

Chart 5

Labour Productivity in Alberta Industries in 2015
(Real GDP per Hour Worked, in 2007 constant dollars)

Source: Statistics Canada -- Table 383-0029, Labour productivity and related variables by business sector industry
* Includes Holding Companies
PSTS: Professional, Scientific and Technical Services

When excluding the mining and oil and gas sector Alberta's business sector productivity level drops to $50.60 per hour, 11% higher than the Canadian average of $45.40. The $50.60 for the business sector excluding energy is much lower than the overall business sector productivity level of $69.30 in Alberta which in turn was 39% higher than the Canadian average. In other words, more than two-thirds of the 39% difference between Alberta and Canada's business sector productivity levels is the result of Alberta's highly productive oil and gas sector.

Although the mining and oil and gas sector has the highest productivity level, its productivity declined sharply between 1999 and 2012: productivity in the oil and gas extraction sub-sector declined by more than two-thirds during that period. There are a number of reasons for this decline. First, Alberta's conventional oil and gas resources were in decline and it took more effort to find and extract each additional barrel or gigajoule. Second, new oil sands projects will have employees on-site before production actually starts, raising hours worked without any increase in GDP. Third, high oil prices made high cost, labour and capital intensive oil reservoirs more attractive.

In more recent years, productivity has improved in the mining and oil and gas sector: in 2013, 2014 and 2015 this sector's productivity advanced by 1.8%, 6.6% and 11.4%, respectively, for a total gain of 21% during those three years. The main reasons for this turn-around are that a number of large oil sands projects started producing and that conventional oil production has staged a recovery during the past few years. It is likely that this sector's productivity will continue to improve as more oil sands projects enter the production phase and as oil and gas producers and service companies find new ways to cut

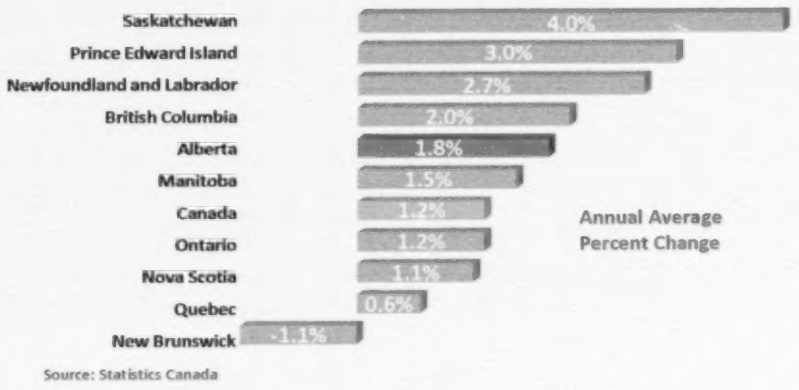
costs and improve productivity to deal with a much lower oil and gas price environment. On a 10-year basis, productivity in mining and oil and gas increased at an annual average rate of only 0.4% between 2005 and 2015 as the recent strong growth was mostly offset by weakness between 2005 and 2012.

Productivity in the Manufacturing Sector Remains Strong

Alberta's manufacturing sector also had the highest productivity of all provinces and exceeded the Canadian productivity level by 34%. Even for this sector the high productivity level was mostly the result of very high levels in its downstream oil and gas sub-sectors: refined petroleum products and chemicals. Alberta's manufacturing sector had relatively strong productivity growth of 1.8% per year between 2005 and 2015, a rate that was higher than Canada's 1.2% growth rate (Chart 6) but much lower than the 3.0% annual increase that was registered in Alberta for the 10-year period ending in 2014. This lower rate of increase is partly the result of the 2015 recession that impacted many manufacturing sectors but especially two of the oil and gas supply chain sectors: machinery and primary metals.

Chart 6

Provincial Labour Productivity Growth Rates - Manufacturing 2005 - 2015 (Based on Hours Worked)

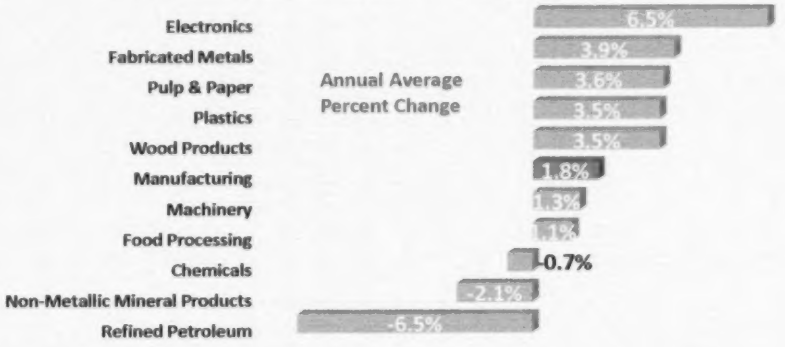


Source: Statistics Canada

The manufacturing sector's strong performance was mainly the result of high productivity growth in the fabricated metals sub-sector, one of Alberta's top three manufacturing sub-sectors, and in the two forestry sub-sectors, wood products and pulp and paper, as well as of strong growth in a few smaller sub-sectors, such as electronics and plastics (Chart 7). The machinery sub-sector, which is the largest manufacturing sub-sector on a GDP basis, saw its productivity increase by 1.3% per year, as the number of hours worked in that sub-sector fell (especially in 2015) over the 10-year

Chart 7

Labour Productivity Growth Rates in Alberta's Manufacturing Sectors, 2005 - 2015 (Based on Hours)



Source: Statistics Canada

period while GDP rose at a modest pace. The food processing sub-sector is Alberta's second largest manufacturing sector on a GDP basis. Its productivity grew by 1.1% per year as GDP rose by 1.3% per year. In the refineries (refined petroleum products) sub-sector, productivity declined by 6.5% per year because production decreased while the number of jobs increased sharply between 2005 and 2015.

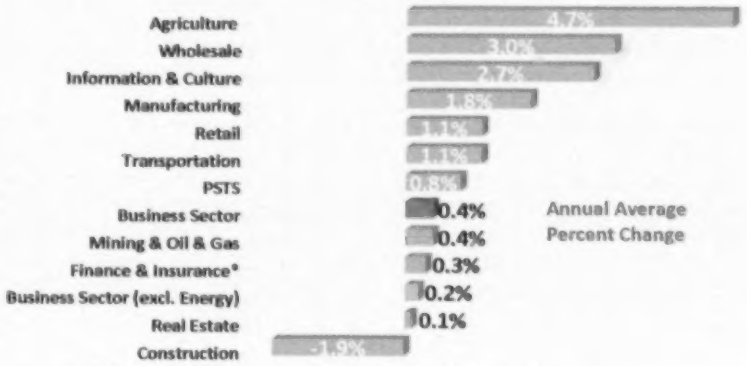
Other Sectors' Productivity Performance

Most other sectors had fairly strong productivity growth (Chart 8). The agricultural sector had the highest productivity growth at 4.7% per year as farm consolidation and capital investment led to a decline in employment while output continued to rise at a modest pace. The wholesale sector's productivity grew by 3.0% per year as a result of strong output growth. Information and culture (mainly telecommunication services) benefited from heavy investment in telecom equipment by telecom providers, such as cell phone companies, and had productivity growth of 2.7% per year. Productivity in the construction sector declined by 1.9% per year because of a large decline in the engineering construction sub-sector which saw its productivity plunge in 2015 because of declining oil and gas investment.

Besides the manufacturing sector Alberta also leads the nation in a number of other business sectors. For instance, even though productivity in Alberta's construction dropped by 11% in 2015 because of the recession, Alberta's productivity level of $51 that year was still the highest in the country. Alberta also leads the nation for these sectors: transportation and warehousing; information and culture; accommodation and food services; and professional, scientific and technical services.

Chart 8

Labour Productivity Growth Rates in Alberta's Industries
2005 - 2015 (Based on Hours)



Sources: Statistics Canada and Alberta Economic Development & Trade
PSTS = Professional, Scientific and Technical Services
* Includes Holding Companies

Summary

Even though the recession caused Alberta's productivity level to decline sharply in 2015, the business sector's productivity level of $69.30 GDP per hour worked was the highest in the country and 39% higher than the Canadian average of $49.90. Alberta's high productivity level is in large part the result of its large and capital-intensive oil and gas extraction sector. If we exclude the energy sector, Alberta's productivity is a much lower $50.60, only 11% ahead of the Canadian average for the non-energy business sector. Alberta also leads the nation in a number of non-oil and gas sectors including construction and manufacturing.

Alberta's business sector productivity growth has been weak historically, mainly because the oil and gas extraction sector had sharply declining productivity between 1999 and 2013. However, productivity growth in the oil and gas sector has recovered in recent years as new oil sands projects came into production and conventional oil production started growing again. Although productivity in that sector is now growing again, overall business sector productivity declined 3.6% in 2015 as the recession impacted a number of sectors. As a result, Alberta's productivity growth rate was only 0.2% per year between 2005 and 2015, compared with a growth rate of 0.8% for the 10-year period ending in 2014.

Note: estimates for labour productivity and for many other economic indicators can be found on the Alberta Economic Dashboard at http://economicdashboard.albertacanada.com/